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(54) **ELECTRONIC SHOPPING CART HANDLE**

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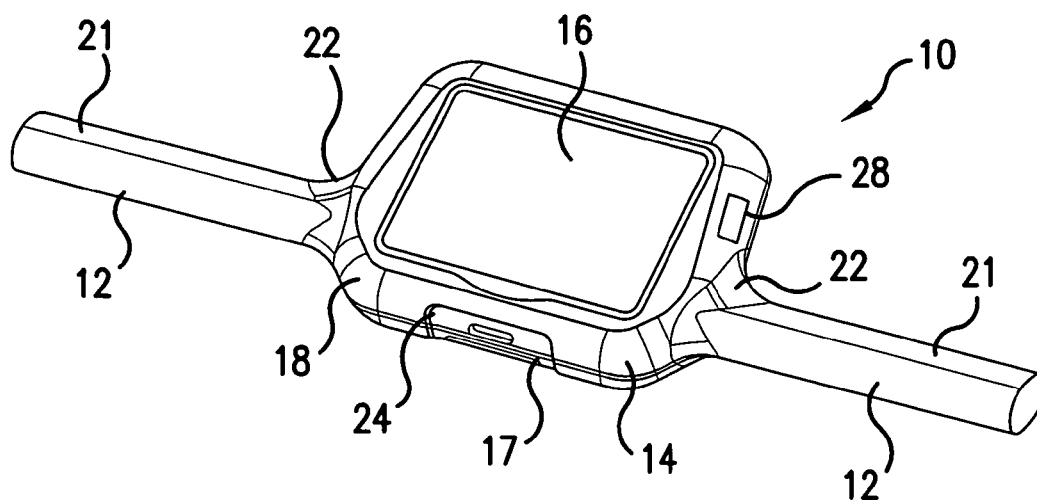
(57) **ABSTRACT**

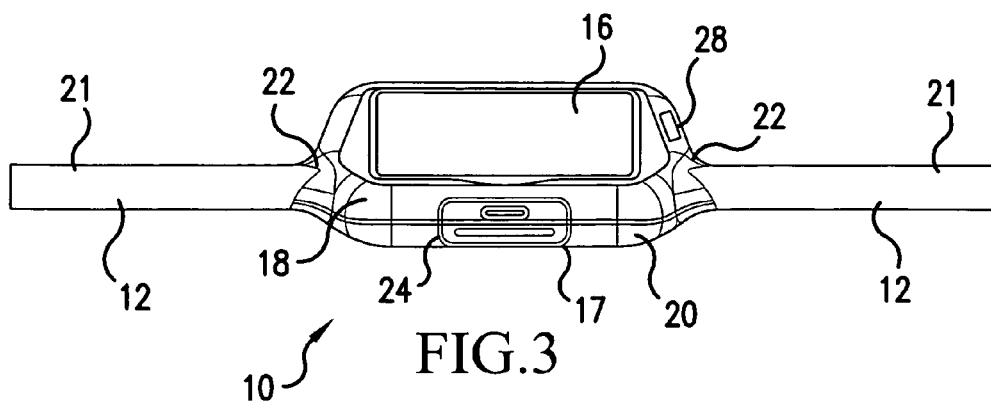
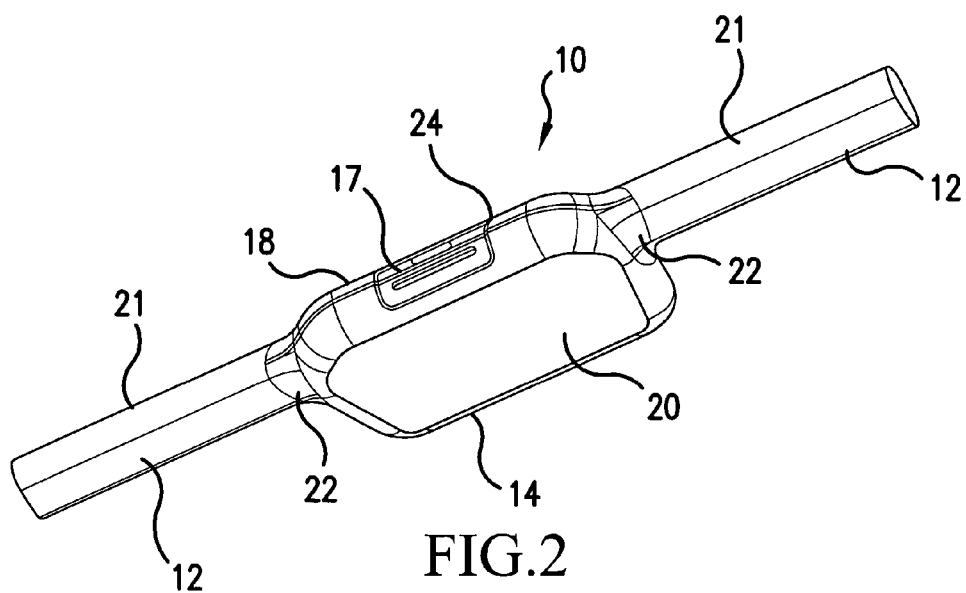
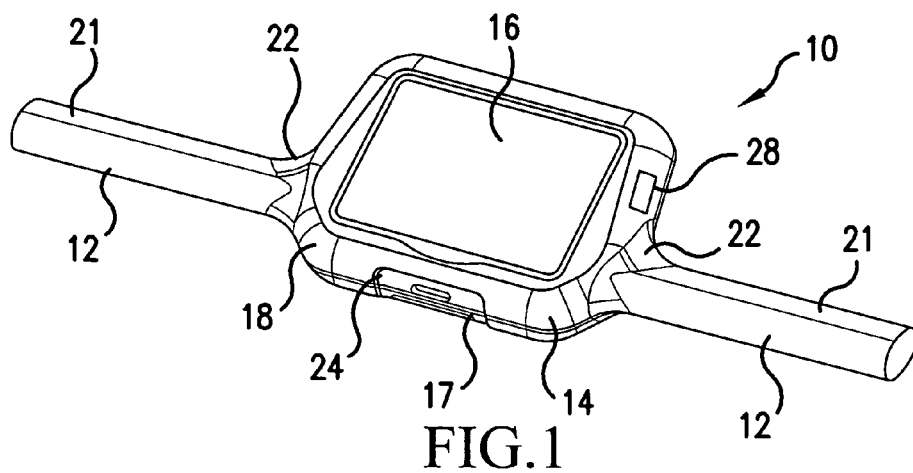
A shopping cart handle includes a housing having a display, electronic circuitry in the housing for generating images on the display, and first and second grip portions each having a flared proximal end connected to the housing and a distal end. The display optionally includes a electronic interface that may be covered by a selectively releasable cover to protect the interface.

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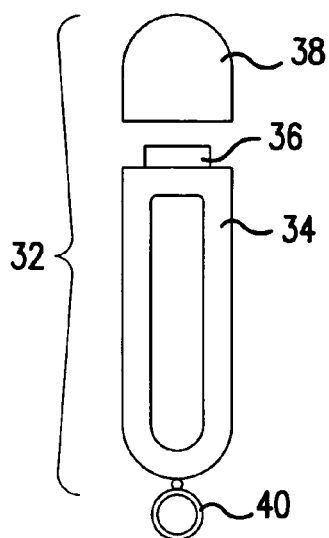


FIG. 4

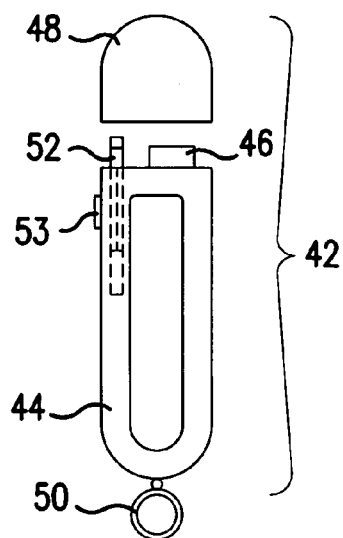


FIG. 5

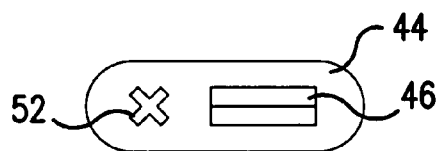


FIG. 6

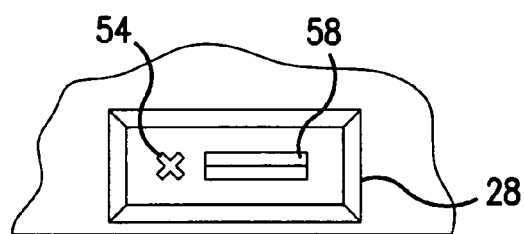


FIG. 7

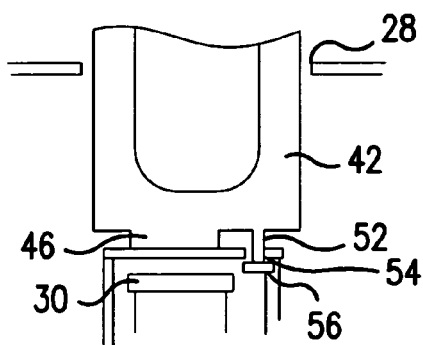


FIG. 8

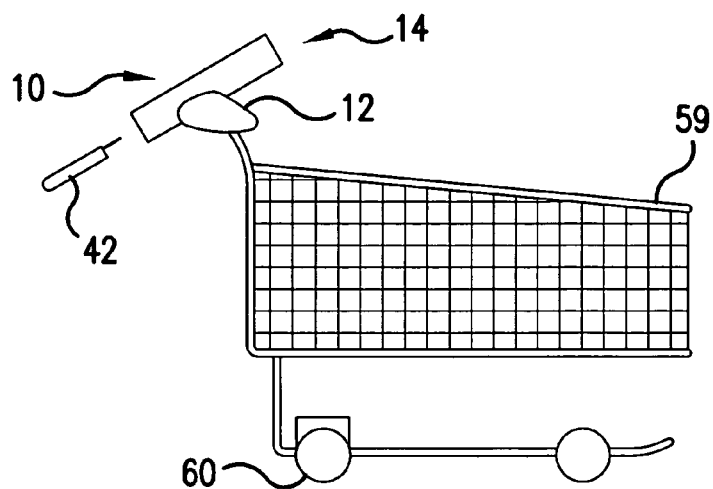


FIG. 9

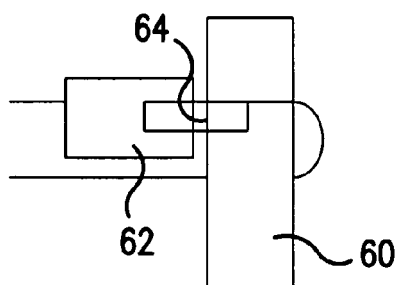


FIG. 10

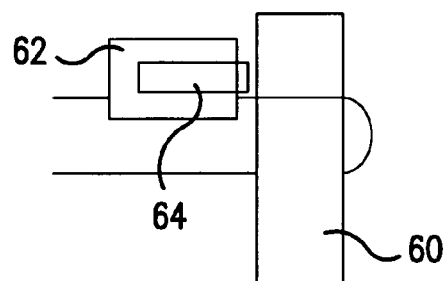


FIG. 11

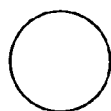


FIG. 23



FIG. 24



FIG. 25

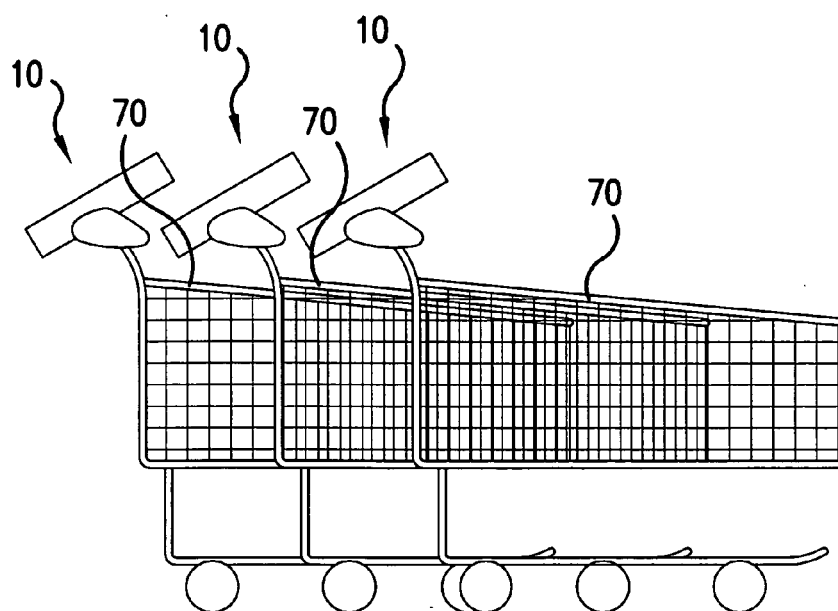


FIG.12

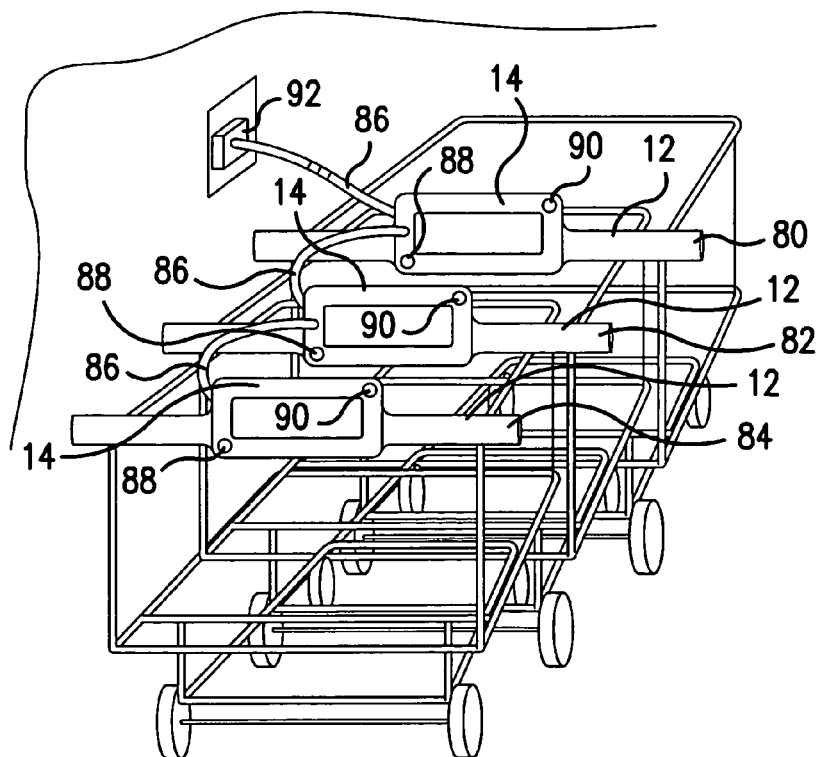


FIG.13

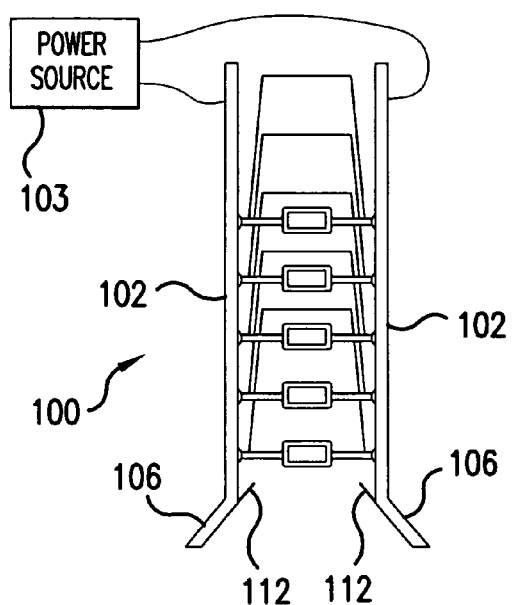


FIG. 14

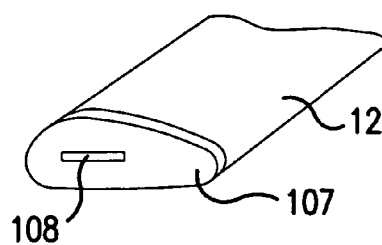


FIG. 15

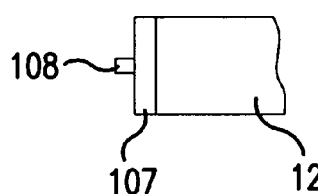


FIG. 16

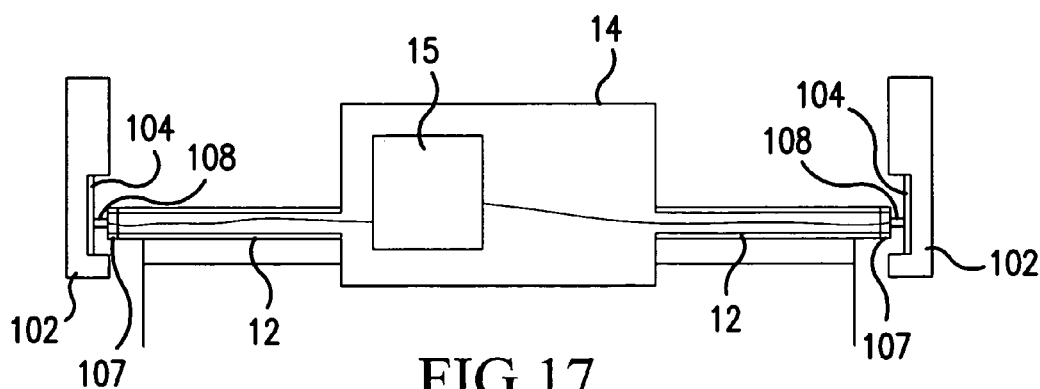


FIG. 17

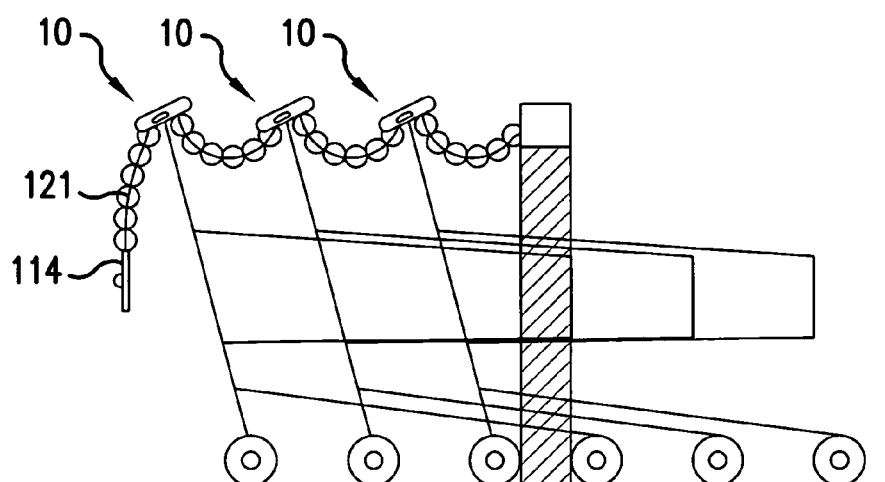


FIG. 18

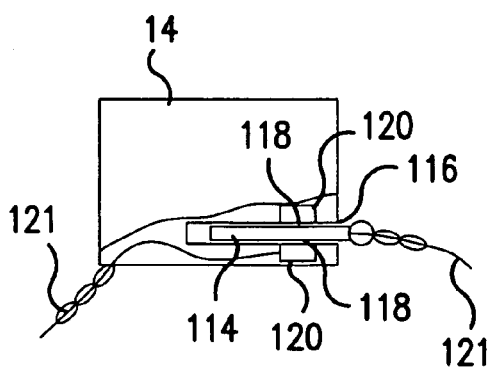


FIG. 19

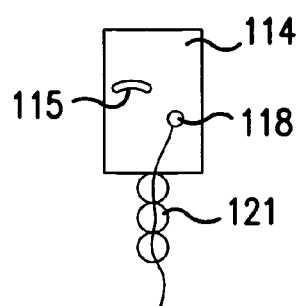


FIG. 20

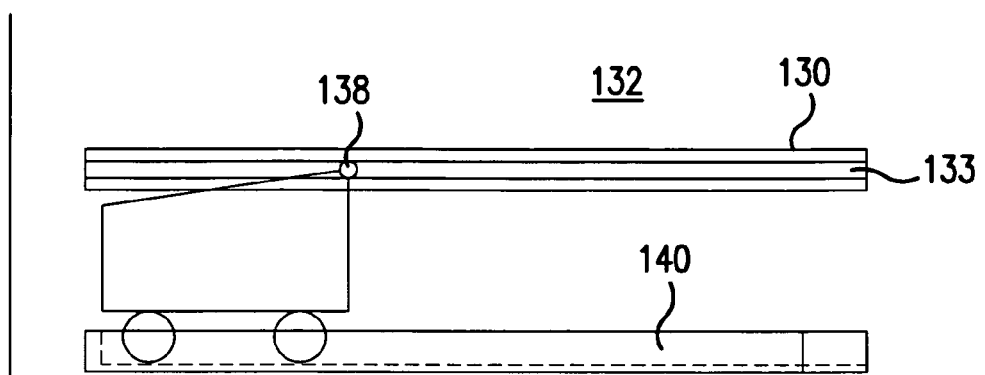


FIG. 21

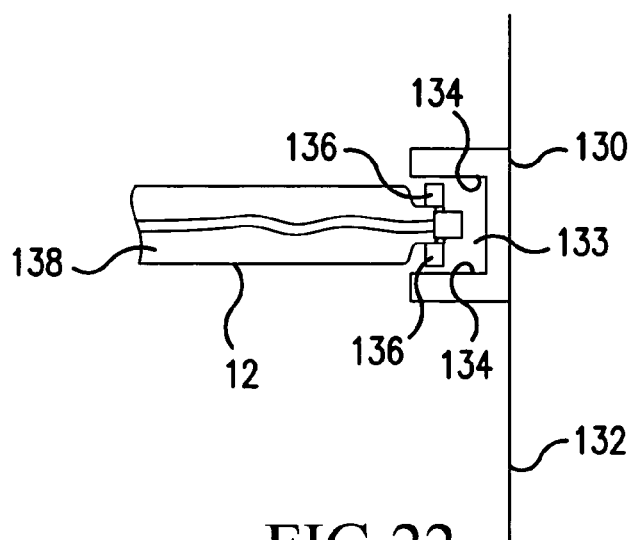


FIG. 22

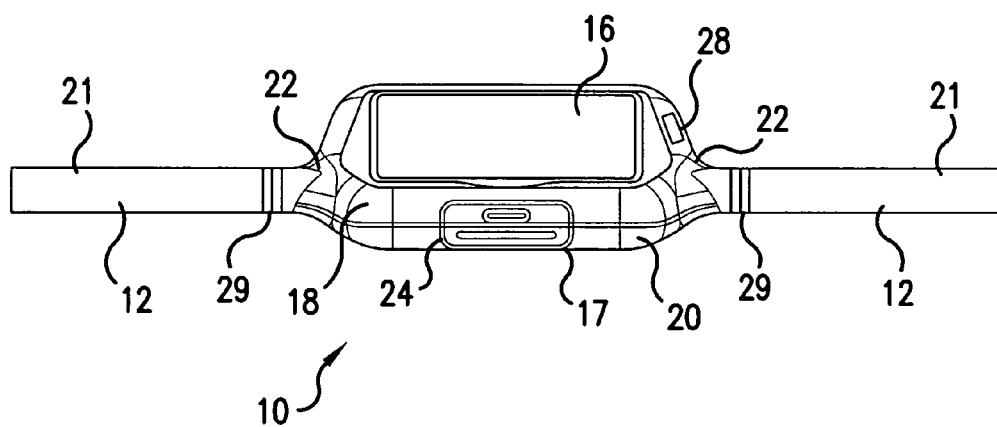


FIG.26

ELECTRONIC SHOPPING CART HANDLE

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims the benefit of U.S. Provisional Patent Application No. 60/675,849 filed Apr. 29, 2005, the entire contents of which is hereby incorporated by reference.

FIELD OF THE INVENTION

[0002] The present invention is directed to an electronic handle for a wheeled cart, and more specifically, toward a shopping cart handle including an electronic module and display for providing a user with information while shopping.

BACKGROUND OF THE INVENTION

[0003] Shopping carts have remained essentially unchanged in form for many years. Recently, however, with the availability of inexpensive, compact computing power, attempts have been made to add small computers to shopping carts to assist users with shopping. For example, it is known to attach bar code readers to shopping carts to allow users to perform price checks and/or to perform a self-check out. One example of such a system is disclosed in U.S. Pat. No. 5,361,871 to Gupta, the contents of which are hereby incorporated by reference. However, the Gupta device appears likely to interfere with proper cart nesting and requires an electrical contact depending from the bottom of the cart for recharging which would likely be damaged in moving the cart through store aisles and/or over curbs in a store parking lot. It is not believed that systems such as the one disclosed in Gupta have been widely adopted.

[0004] Related shopper-assisting devices that clip or otherwise detachably mount to a shopping cart handle are also known. However, these must be taken from a rack or other storage location by a user and attached to a cart handle before use. When a shopper reaches the check-out line, store personnel must detach the unit from the car and return the unit to a storage and/or charging station or rely on the customer to perform these actions. It is believed that these inconveniences have kept such devices from being widely adopted.

[0005] It would therefore be desirable to provide an electronic shopper assisting device that is easy to use and maintain and that does not suffer from the aforementioned drawbacks.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] Various aspects and features of embodiments of the present invention will be better understood after a reading of the following detailed description together with the accompanying drawings wherein:

[0007] **FIG. 1** is a front perspective view of a cart handle including an electronic module according to an embodiment of the present invention;

[0008] **FIG. 2** is a rear perspective view of the cart handle of **FIG. 1**;

[0009] **FIG. 3** is a front elevational view of the cart handle of **FIG. 1**;

[0010] **FIG. 4** is a side elevational view of a first activation device for use with an electronic handle according to an embodiment of the present invention;

[0011] **FIG. 5** is a side elevational view of a second activation device for use with an electronic handle according to an embodiment of the present invention that includes a key for unlocking a slot in an electronic module;

[0012] **FIG. 6** is a top plan view of the activation device of **FIG. 5** with its cap removed;

[0013] **FIG. 7** illustrates a slot for receiving the activation device and key of **FIG. 5**;

[0014] **FIG. 8** illustrates the activation device of **FIG. 5** being received in the slot of **FIG. 7**;

[0015] **FIG. 9** illustrates an electronic handle according to an embodiment of the present invention used with a cart wheel locking device wherein the wheel locking device is controlled by an electronic cart handle;

[0016] **FIG. 10** illustrates the wheel locking device of **FIG. 9** locking a cart wheel when an activation device is disconnected from the electronic cart handle;

[0017] **FIG. 11** illustrates the wheel locking device of **FIG. 9** unlocking a cart wheel when an activation device is inserted into a slot in the electronic cart handle;

[0018] **FIG. 12** schematically illustrates the nesting of several shopping carts which carts include the electronic cart handles of **FIG. 1**;

[0019] **FIG. 13** is a perspective view of several nested carts that include the electronic cart handles of **FIG. 1** wherein the cart handles are electrically interconnected for battery recharging;

[0020] **FIG. 14** illustrates a plurality of nested carts including a second embodiment of an electronic cart handle according to the present invention having batteries being recharged by a corral having charging rails;

[0021] **FIG. 15** is a perspective view of one end of the electronic cart handle of **FIG. 14**;

[0022] **FIG. 16** is an elevational view of the end of the electronic cart handle of **FIG. 15**;

[0023] **FIG. 17** schematically illustrates an electronic cart handle between two charging rails of the corral of **FIG. 14**;

[0024] **FIG. 18** illustrates a third embodiment of an electronic cart handle in which electrical connectors are integrated with a locking device for securing adjacent carts to one another;

[0025] **FIG. 19** illustrates one of the electrical connectors of **FIG. 18** in a housing on an adjacent cart;

[0026] **FIG. 20** is a plan view of the connector end of **FIG. 19**;

[0027] **FIG. 21** illustrates a charging rail and guide channel arrangement for charging the battery of an electronic cart handle;

[0028] **FIG. 22** is a sectional view of an end of the electronic cart handle and charging rail of **FIG. 21**;

[0029] **FIG. 23** illustrates a first cart handle grip cross section;

[0030] FIG. 24 illustrates a second cart handle grip cross section;

[0031] FIG. 25 illustrates a third cart handle grip cross section; and

[0032] FIG. 26 illustrates an alternate version of the cart handle and module of FIGS. 1-3.

DETAILED DESCRIPTION

[0033] Referring now to the drawings, wherein the showings are for purposes of illustrating preferred embodiments of the invention only, and not for the purpose of limiting same, FIG. 1 illustrates a cart handle 10 comprising first and second grips 12 extending from a central housing 14. Central housing 14 includes a display 16, preferably a touch screen display, and a hollow interior for containing an electronic module or modules, a battery 15, illustrated in FIG. 17, a circuit board, a bar code reader 17, and other functional elements discussed herein. Housing 14 includes a first or front portion 18 formed integrally with grips 12 and a rear portion 20 mounted to front portion 18 either removably using fasteners such as screws or via a snap fit, or permanently using suitable adhesives, for example. When rear portion 20 is removably mounted, a suitable gasket is provided to ensure an watertight seal that will at the same time allow the unit to breathe and minimize condensation build up in the hollow interior of housing 14.

[0034] Grips 12 include gripping portions 21 and join housing 14 at reinforced portions 22 to increase the strength of handle 10 and to reduce the likelihood of damage where the grips 12 join housing 14 when the handle is pushed or pulled or when downward pressure is placed on the housing 14. The gripping portions 21 have a circumference (or periphery if the grip portion does not have a circular cross section) of about 3 inches or 8 centimeters over most of their length to make them comfortable to grip for a user. Reinforced portions 22 are flared and have a larger circumference or periphery which increases from the periphery of the gripping portion 21 to the sidewall of housing 14. As will be appreciated from FIGS. 1 and 2, the flared reinforced portion 22 surrounds the gripping portions 21 of grips 12 on all sides so that a cross section of the gripping portion 21 projected toward housing 14 will pass through without intersecting the largest circumference or periphery of reinforced portions 22.

[0035] As illustrated in FIG. 26, housing 14 may optionally include a ratchet mechanism 29 to allow the angle of housing 14 and thus of screen 16 to be changed. Preferably, the ratchet mechanism 29 allows housing 14 to be pivoted until screen 16 faces a child seat in the cart so that, for example, videos could be displayed on screen 16 to entertain children while shopping. The ratchet mechanism could be provided at any point along the length of gripping portions 21 of grips 12 or, with a somewhat modified housing 14, not shown, at the interface of grips 12 and housing 14 or inside housing 14.

[0036] Grip portions 12 are formed to have the greatest length required for a standard shopping cart and can be cut to shorter lengths for smaller carts. The gripping portions 21 of grips 12 can have various cross sections such as the round cross section illustrated in FIG. 23, the generally ovate cross section of FIG. 24 and the kidney shaped cross section of

FIG. 25. While gripping portions 21 are described herein as being integrally formed with front portion 18 of housing 14, they can alternately be formed separately from housing 14 and connected thereto in a suitable manner. Alternately, for existing carts having handles that are not readily removable, housing 14 can be provided with suitable clamps or other fasteners to connect housing 14 and the electronic modules contained therein to an existing shopping cart handle in a permanent or semi-permanent manner.

[0037] The housing and internal components are adapted to operate over a wide range of temperatures, -45° C. to 70° C., for example, so that the device can, for example, be stored outdoors in both extreme winter conditions and in direct sunlight in summer, and be resistant to both moisture and the impacts that are likely to be suffered by a shopping cart handle. The grips and housing are preferably formed from a suitable thermoplastic material.

[0038] Battery 15 is rechargeable and should be capable of operating the electronic modules for approximately 16 hours before recharging.

[0039] Housing 14 includes an opening 24 for receiving a modular bar code reader 17 and an opening 28 providing access to an internal I/O port 30, illustrated in FIG. 8, for example, which in the presently preferred embodiment comprises a USB port. Hardware contained within housing 14 will perform various functions and provide various displays on screen 16 which functions and displays do not comprise a part of the present disclosure.

[0040] The hardware in housing 14 may be activated by inserting an activation device into port 30. In the present embodiment, the activation device comprises a solid state storage device 32 having a USB interface compatible with port 30. Alternately, the electronic module could be activated using bar code reader 17 to scan a bar code carried by an authorized user—on a customer loyalty card, for example. When storage device 32 is used, information about a user on device 32 can optionally be made available to a processor in housing 14 and/or transmitted to a central server in wireless communication with electronic cart handle 10.

[0041] Storage device 32 can be used to receive and store information from electronic cart handle 10 or a server in communication with the handle which information a user may later access using, for example, a home computer. Where privacy is an issue, device 32 may merely contain a serial number to identify the device 32 to a secure server in communication with the electronic module. In such cases, no personal information would be stored on device 32. This would substantially prevent the disclosure of private information if a device 32 is lost. For purposes of the present disclosure, it is merely necessary to know that an authorized user can be identified to a processor in housing 14 with either device 32 or a bar code on a customer loyalty card, and that a processor in the electronic module, which may for example be in wireless communication with a server and/or the internet, can provide information to the user of the electronic cart handle 10 based on previously stored preferences.

[0042] Memory device 32 is illustrated in FIG. 4 and includes a body portion 34 in which a suitable compact flash or other solid-state memory is contained, a USB connector

36 insertable into drive 30, a cap 38 and a ring 40 or similar arrangement to allow device 32 to be connected to a key ring.

[0043] An alternate memory device 42 is illustrated in FIG. 5. Memory device 42, in addition to a body portion 44 holding solid state memory, a USB connector 46, a cap 48 and a ring 50, includes a key member 52 having a predetermined shape, which is a cross in the present embodiment. The shape of key member 52 matches the shape of a key opening 54, illustrated in FIG. 7, in a housing adjacent port 30. Key member 52 fits into key opening 54 when memory device 42 is used. Key member 52 projects further from body 44 than connector 46 and thus enters key opening 54 and actuates a release mechanism 56 which unlocks doors 58 over port 30. This arrangement makes it less likely that foreign objects will be inserted into drive 30 and makes it more difficult for a user to use an unauthorized device in USB port 30. Key 52 may be retractable, with a thumb slide 53, for example, to make USB drive 30 usable with standard USB ports, such as the ports found on a user's home computer.

[0044] In addition to activating electronic modules in housing 14, the insertion of memory device 32 or 42 can perform a security function as well. As illustrated in FIGS. 9-12, the cart 59 to which electronic handle 10 is attached may include a wheel locking arrangement for securing the wheels 60 of shopping carts. These wheel locking devices may comprise a solenoid 62 for selectively driving a rod 64 into an opening in wheel 60 to substantially prevent wheel 60 from turning. Solenoid 62 is controlled by signals from the processor in housing 14 and only unlocks wheels 60 when an authorized memory device 32, 42 is inserted into port 30.

[0045] FIG. 12 illustrates a plurality of nested shopping carts 70 equipped with electronic handles 10. The size and position of housing 14 substantially prevents the handles 10 from interfering with cart nesting when mounted on a variety of standard carts. In addition, electronic cart handle 10 is preferably mounted so that display 16 makes an angle of about 30 degrees with respect to the horizontal to improve visibility and minimize glare, while not interfering with the use of a child seat in the cart or with cart nesting.

[0046] FIG. 13 illustrates a daisy chain arrangement for recharging batteries 15 contained within housing 14 of a plurality of nested carts 80, 82, 84. As will be apparent from these figures, each housing 14 includes a power cord 86, a power outlet 88 and a power LED 90 which lights when power is being supplied to the cart on which LED 90 is mounted. The power cord 86 on first cart 80 is attached to a suitable DC power source 92 (such as a transformer connected to an AC power source), the power cord 86 of second cart 82 plugs into power outlet 88 of the first cart 80, and the power cord 86 of third cart 84 plugs into power outlet 88 of second cart 82. LED's 90 on each cart turn on when that cart is connected to a source of electric power. In this manner, it can readily be determined whether all carts in a nested series are being recharged. This arrangement is best suited for a last-in first-out arrangement of carts and therefore is primarily intended for situations wherein groups of carts are connected and fully charged, overnight, for example, before being used by purchasers. In an alternate arrangement, each of the plurality of nested carts could be

plugged individually into a power source until fully charged. This would allow for the carts that have been charging the longest to be removed from a series of carts first, over the course of a business day.

[0047] FIG. 14 illustrates a cart corral 100 having first and second rails 102 each of which is provided with an electrically conductive charging rail 104, best seen in FIG. 17, connected to a power source 103. Corral 100 includes first and second angled guide members 106 for guiding a cart into the corral. Electrical contacts 108 on the ends of grip portions 12 make electrical contact with these charging rails to recharge a battery 15 inside housing 14. The contacts 108 may alternately be formed in separate end caps 107 which can be attached to the grip portions 12 after grip portions 12 are cut to a proper length. Either contacts 108 or charging rails 104 may be flexible or displaceable to ensure a good electrical connection between contacts 108 and charging rail 104 even when the separation between rails 102 and or the separation between the ends of handle 10 is not constant. Alternately, end caps 107 can be telescopically mounted within handle grip portions 12 and spring biased away from one another to accommodate variations in the separation between the charging rails. Corral 100 may further include hinged flaps 112 or similar structures to ensure that carts pass through the corral in a single direction and that the cart that has been charging for the longest period time is removed first to provide for first in first out recharging.

[0048] FIG. 18 illustrates a charging system integrated into a daisy chain cart security system. In such a security system, nested carts are secured by inserting a member 114 chained to one cart into a slot 116 on an adjacent cart. The member 114 may be released by inserting a coin or token to release a single cart. The coin or token is returned when the cart is returned to the nested line of carts after use. An example of such a daisy chain locking system (which does not include the electrical charging system of the present invention) is illustrated in U.S. Pat. No. 4,474,282 to Lenader, the contents of which are hereby incorporated by reference.

[0049] As illustrated in FIGS. 19 and 20, member 114 includes a hasp 115 that connects to a locking mechanism in slot 116 and electrical contacts 118 that engage electrical contacts 120 in slot 116 to electrically connect two carts. Electrical contacts 120 in slot 116 are in turn connected by wire 121 to the electrical contacts 118 of a member chained to that cart which can be inserted into a slot 116 of an adjacent cart in a similar manner to electrically connect and mutually secure a plurality of nested carts in series.

[0050] FIG. 21 illustrates a recharging system that comprises a single rail 130, mounted, for example on a wall 132. Rail 130 includes a channel 133 in which a pair of spaced electrical contacts 134 are mounted, one above the other for making electrical contact with a pair of vertically projecting electrical contacts 136 on the end of a cart handle 138. A guide channel 140 is provided on the ground adjacent rail 130 to help guide the cart wheels and properly position cart handle 138 with respect to rail 130. This arrangement is space-efficient and allows for the recharging of a battery through a single end of a cart handle.

[0051] The present invention has been described herein in terms of several preferred embodiments. Obvious additions and modifications will become apparent to those skilled in

the relevant arts upon a reading of the foregoing description. It is intended that all such obvious modifications and additions be included within the scope of this invention.

We claim:

1. A shopping cart handle comprising:
 - a housing having a display;
 - electronic circuitry in said housing for generating images on said display;
 - first and second grip portions each having a flared proximal end connected to said housing and a distal end.
2. The shopping cart handle of claim 1 wherein said grip portion has a first periphery having a first length at a point between said proximal end and said distal end and said grip portion at said proximal end has a second periphery having a second length greater than said first length.
3. The shopping cart handle of claim 2 wherein a projection of said first periphery passes entirely within said second periphery.
4. The shopping cart handle of claim 2 wherein said flared proximal end comprises a plurality of wall members.
5. The shopping cart handle of claim 1 wherein said first and second grip portions are integrally formed with said housing.
6. The shopping cart handle of claim 1 including a battery compartment in said housing.
7. The shopping cart handle of claim 1 including a battery mounted entirely within said housing.
8. The shopping cart handle of claim 1 wherein said housing is pivotably mounted with respect to said first and second grip portions, whereby a position of the display relative to the grip portions can be varied.
9. The shopping cart handle of claim 8 including first and second ratchet mechanisms between said first and second grip portions and said housing.
10. The shopping cart handle of claim 1 wherein said housing includes a first housing portion formed integrally with said first and second grip portions and a second housing portion connected to said first housing portion.
11. The shopping cart handle of claim 1 wherein said electronic circuitry includes a processor and including an electrical connector on the housing for connecting an external memory to the processor.
12. The shopping cart handle of claim 11 wherein said electrical connector comprises a USB connector.

13. The shopping cart handle of claim 11 including a selectively unlockable cover over said electrical connector.

14. A shopping cart handle comprising:

- a housing having a first portion and second portion connected to the first portion and having a display;
- electronic circuitry in said housing for generating images on said display;
- first and second grip portions each having a proximal end connected to said housing first portion and a distal end;
- a battery mounted in said housing and outside said first and second grip portions.

15. The shopping cart handle of claim 14 wherein

- said electronic circuitry includes a processor;
- said first and second grip portions each include a flared proximal end connected to said housing; and
- said housing includes an electrical connector for connecting an external memory device to said processor and a selectively unlockable cover for protecting said electrical connector.

16. A shopping cart handle comprising:

- a housing having a first portion and second portion connected to the first portion and having a display;
- electronic circuitry in said housing including a processor for generating images on said display;
- said housing including an electrical connector operably connected to said processor for connecting an external memory device to said processor; and
- at least one grip member connected to said housing and to a shopping cart.

17. The shopping cart handle of claim 16 including a battery compartment in said housing.

18. The shopping cart handle of claim 16 wherein said first and second grip portions each include a flared proximal end connected to said housing.

19. The shopping cart handle of claim 16 including a selectively unlockable cover protecting said electronic connector.

20. The shopping cart handle of claim 19 including a release for unlocking the selectively unlockable cover.

* * * * *